

Remarks

All of the claim rejections are improper because the rejections are based upon a combination of Wu (U.S. 6,617,565) with Goldman (U.S. 6,825,927) that does not teach or suggest all of the claim limitations, because there is no motivation to modify Goldman (*i.e.*, consistent with recent Supreme Court decisions), and because Goldman's fluorometer cannot be implemented using Wu's CMOS approach. Specifically, the discussion in the final Office Action as to what the Goldman reference *could* teach (with allegedly "inherent" functionality), fails to show correspondence to the claimed limitations. In addition, the final Office Action's suggestion that Goldman's fluorometer controller - CCD camera would function using Wu's CMOS sensor approach, simply because Wu and Goldman both involve optics, is insufficient to show that such an approach is either motivated or would function. As is further discussed below, Goldman's fluorometer controller - CCD camera simply cannot be integrated on Wu's CMOS chip as suggested in the final Office Action.

The final Office Action dated July 30, 2007 listed two rejections under 35 U.S.C. § 103(a): claims 1-30 stand rejected under § 103(a) over Goldman (U.S. 6,825,927) in view of Wu (U.S. 6,617,565); and claims 31-37 stand rejected under § 103(a) over Goldman and Wu as applied to claim 26, and further in view of Herron *et al.* (U.S. 6,222,619). Applicant traverses all of these Section 103 rejections, each of which relies upon the improper combination of Wu with Goldman. The following more particularly addresses the rejections and their impropriety, beginning with the failure of the proposed combination to teach or suggest all of the claimed limitations.

Contrary to the Examiner's assertion, the Goldman reference, modified with Wu's teachings, does not teach or suggest claim limitations directed to light detectors integrated with detector processing circuitry on a common chip to detect light from individual sample wells. In short, the final Office Action's assertion that the allegedly inherent CCD camera arrangement would be implemented on a single chip with corresponding processing circuitry is unsupported in the cited references and is further contrary to well-known characteristics of CCD cameras (*see, e.g.*, Holst, G., 1991. CCD Arrays, Cameras, and Displays, 2nd edition, SPIE Press; also as cited in Biosensors and Bioelectronics 19 (2004) 1377-1386 at 1381 (first column, line 3), which is attached to this response).

In addressing the impropriety of the rejections, it is useful to understand the nature of CCD cameras and their implementation. As is well-understood in the art (*i.e.*, and as relevant to the above-cited Holst reference), CCD devices exhibit temperature and other operational characteristics that limit their application to low-cost, compact devices. Generally, CCD devices employ a readout mechanism to serially shift out photogenerated electrons accumulated at each photo site, and are fabricated using a nonstandard semiconductor process that is implemented for sensing and charge transfer. To mitigate noise, CCD devices are cooled, often using liquid nitrogen or a stack of Peltiers; however, such cooling is undesirable for various reasons. For instance, liquid nitrogen is expensive and cumbersome to implement (storage and application). Peltiers require the use of several high-voltage supplies that consume high power. In this regard, analog or digital circuits, such as those implemented for clock generation, timing, analog to digital (A/D) conversion, digital processing and storage, are not integrated with a CCD image sensor on a single chip.

In view of the above, CCD cameras implemented with Goldman's fluorometer would generally involve separate processing circuitry, and thus likely necessitate a multi-chip imaging system that exhibits relatively high power consumption, high cost and large size. In this regard, Goldman's fluorometer cannot be implemented with a CCD camera on a chip in a manner that is consistent with the Wu reference. The final Office Action has not provided any evidence from the prior art to the contrary, or explained how the proposed CCD camera fluorometer could or would function as asserted. Therefore, the proposed modification of the fluorometer – CCD camera of the Goldman reference does not correspond to the claimed limitations.

The final Office Action has not provided evidence of motivation or shown a likelihood of success for the proposed modification, and the discussion of Wu and analogous art misses the point at issue. That is, the motivation requirement goes to what one of skill in the art would be motivated to do when viewing the cited references, and the necessity of a likelihood of success goes to what is possible to combine. Here, the final Office Action's recitation to *In re Oetiker* (intimating that a prior art reference must be "reasonably pertinent to the particular problem") stops short of showing either motivation or a likelihood of success in that such pertinence does not mean that two references meet the requirements for establishing obviousness under Section 103. That

is, the Examiner's suggestion that "it does not matter what types of optical detection devices" are described in the respective references, even though certain devices cannot be implemented as other devices are, ignores the requirements under Section 103 and is further contrary to M.P.E.P. Section 2141.01(a). Applicant submits that it does indeed matter what types of optical detection devices are used, and further that any analogous reference must be analogous to that which is known in the art.

In this instance, the disparity between the nature of the references and the lack of evidence of motivation for making the proposed combination results in the combination being neither motivated nor likely to succeed. More particularly, the rejection does not show how Goldman's fluorometer controller can be implemented with a CCD camera on a CMOS chip as taught by Wu, as this approach is contrary to well-known aspects of CCD devices as discussed above. Other than asserting that both references generally relate to optics, the rejection does not cite any evidence showing why one of skill in the art would be motivated to make the proposed modification. For example, the Response to Arguments at page 7 of the final Office Action suggests that the proposed combination can "reduce the cost of device" and that "a compact device is obtained" but is silent as to how Goldman's fluorometer controller would be reduced in cost, or how a compact device could be obtained. In view of the above discussion of CCD devices and as is well-known in the art, using a CCD camera with Goldman's fluorometer as suggested in the final Office Action would not only increase cost, it would require that the device not be implemented on a common chip as claimed. Given the disparate nature of the references and the above discussion, Applicant cannot ascertain how these alleged cost reductions or compact structures could be obtained with Goldman's device. Neither reference teaches or suggests that Goldman's fluorometer controller could function using Wu's CMOS circuit for large-item viewing and movement detection relative, for example, to size, sensitivity and noise. In addition, neither reference suggests that Wu's integrated circuit could replace Goldman's detector and processor. In this regard, the Wu reference is not pertinent to the problem (the fluorometer) in the Goldman reference and it cannot be obvious, as the Office Action asserts, to combine Goldman's CCD camera and processing circuit on a single chip in view of Wu. As the rejection does not show how the proposed combination can function or is motivated, the rejection must be reversed.

The Section 103 rejections fail to provide teaching or suggestion of all claim limitations, including those directed to light detectors and related circuitry on a common chip, and further fail to provide evidence of motivation or any likelihood of success. As all of the Section 103 rejections rely upon the combination of Wu with Goldman, and as this combination does not meet the requirements for establishing obviousness under Section 103, the rejections must be removed.

In view of the above discussion, Applicant believes that each of the rejections has been overcome and that the application is in condition for allowance. A favorable response is requested. Should there be any remaining issues that could be readily addressed over the telephone, the Examiner is encouraged to contact the undersigned at (651) 686-6633.

Respectfully submitted,

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